Display Controller

User Guide

Windows 7 and Windows 8.1

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BARCO

Visibly yours

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1. WELCOME!

1.1 About the product

Display Controller

Thank you for choosing this Barco Display Controller!

Barco's state-of-the-art Display Controllers deliver the performance, quality and stability required for today's advanced medical imaging applications. The powerful boards ensure ultra-fast and smooth image loading, roaming and manipulation of images in every resolution.

Use the instructions in this guide to install your Barco Display Controller.

1.2 What's in the box

Contents

Your Barco Display Controller comes with:

- This Barco Display Controller User Guide
- 2 Single-Link Dongles are included with the MXRT-4500, MXRT-5400, MXRT-5500, MXRT-7400 & MXRT-7500.
- 1 Single-Link Dongle and 1 low-profile bracket are included with the MXRT-2400 & MXRT-2500.
- 1 DMS-59-to-DVI adapter cable and 1 low-profile bracket are included with the MXRT-1450 & MXRT-1451.

Keep your original packaging. It is designed for this Display Controller and is the ideal protection during transport and storage.

2. DISPLAY CONTROLLER INSTALLATION

2.1 Which Display Controller ?

Display Controller range

Your Barco medical display is compatible with a large range of Barco and non-Barco Display Controller boards. Depending on the order details, the display can be delivered with or without a Display Controller.

If you are installing a Barco Display Controller, please follow the installation instructions in this section. If you are installing a non-Barco display controller, please consult its corresponding documentation.

2.2 Installing a Barco Display Controller

Guidance

This chapter will guide you through the physical installation of a Barco Display Controller for your display system.

WARNING: Wear a grounded, protective ESD strap when handling or during installation of the Display Controller. Electrostatic charges can damage the Display Controller.

Overview

Prior to installing the Barco Display Controller(s) for your Barco Display System in your workstation, please take a few minutes to familiarize yourself with the Display Controller(s) and the PCIe slots.

Types of Display Controllers for Barco Display Systems

The following models of Barco Display Controllers are available for your display system. Please check which of the following models is delivered with your system and follow the corresponding installation instructions:

Barco Model	Compatible PCIe Slot
Barco MXRT-1450	x1[1], x8, x16
Barco MXRT-1451	x1[1], x8, x16
Barco MXRT-2400	x16
Barco MXRT-2500	x16
Barco MXRT-4500[2]	x16
Barco MXRT-5400	x16
Barco MXRT-5450	x16
Barco MXRT-5500	x16
Barco MXRT-5550	x16
Barco MXRT-7400	x16
Barco MXRT-7500	x16

1. Recommended PCIe slot. You can also use x16 & x8 slots for x1 boards.
2. Available in limited markets

Which PCIe slot to use

The table above lists the various Display Controller model(s) available for your Barco Display System and the recommended PCIe slot to use for optimum performance. The figure below shows the different types of PCIe slots that can be used.

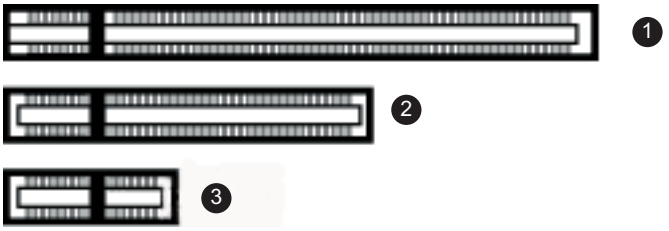


Image 2-1
Examples of PCIe slots

1. x16 slot
2. x8 slot
3. x1 slot

2.3 Installation procedure

How to install

The following instructions will take you step by step through the installation of the Barco Display Controller(s) for your Barco Display System.

1. If you are not going to use your old Display Controller, uninstall its drivers and software.
   Warning: *Wear a grounded, protective ESD strap when handling or during installation of the Display Controller. Electrostatic charges can damage the Display Controller.*
2. Turn off the computer, display(s), and other peripheral devices.
3. Unplug the computer's power cord and disconnect all cables from the back of your computer.
   Warning: *Wait approximately 20 seconds after unplugging the power cord before disconnecting a peripheral or removing a component from the motherboard to avoid possible damage to the motherboard.*
4. Remove the computer cover. If necessary, consult your computer's manual for instructions.
5. If necessary, unscrew or unfasten and remove any existing display controller(s) from your computer.
   Tip: *If you are using a motherboard containing an on-board graphics solution and do not intend to use it as part of a multiple-display setup, disable it either in the computer's System Set-up utility (BIOS) or the Windows device manager.*
6. Locate the appropriate slot and, if necessary, remove the metal back-plate cover(s).
7. Align the Barco Display Controller(s) for your Barco Display System with the slot(s) and press it(them) in firmly until the card(s) is(are) fully seated.
   Tip: *The next step applies only to the MXRT-7400 & MXRT-7500.*
8. Connect the power cable to the 6-pin power connection on the Display Controller. Make sure the cables are not interfering with anything inside the computer (for example, a cooling fan).

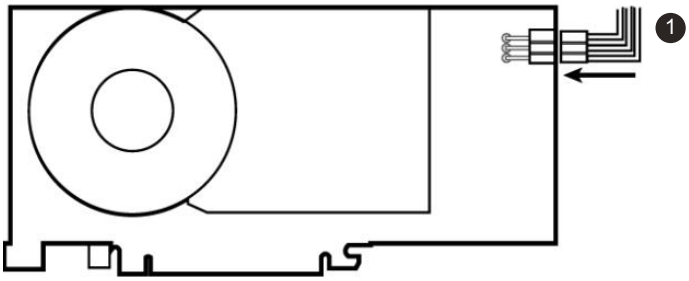


Image 2-2
Power connection for the MXRT-7400 & MXRT-7500 controllers

1. 6-pin graphics controller power cable

9. Screw in or firmly fasten the Display Controller. Replace and secure the computer cover.

2.4 Connecting your Barco Displays

For a detailed description of the display installation and signal connection, please refer to the Display User Guide.

IO-Panel for the Barco MXRT-1450 & MXRT-1451

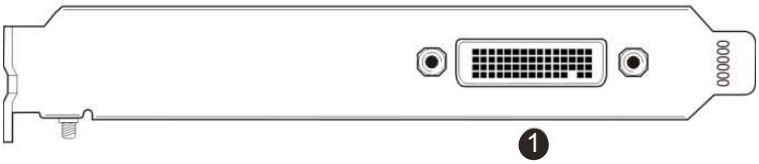


Image 2-3
MXRT-1450 & MXRT-1451

1. DMS-59 connector provides DVI-I / Head 1 & Head 2 output connections through included the Y-adapter cable.

IO-Panel for the Barco MXRT-2400 & MXRT-2500

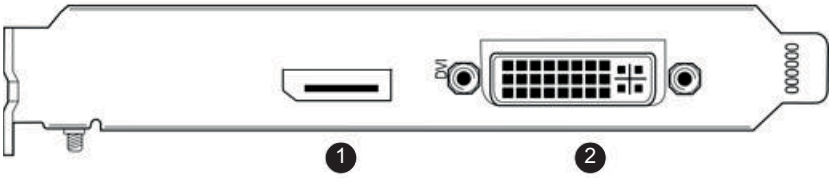


Image 2-4
MXRT-2400 & MXRT-2500

1. DisplayPort Connection
2. DVI-I Connection

IO-Panel for the Barco MXRT-5450 & MXRT-5550

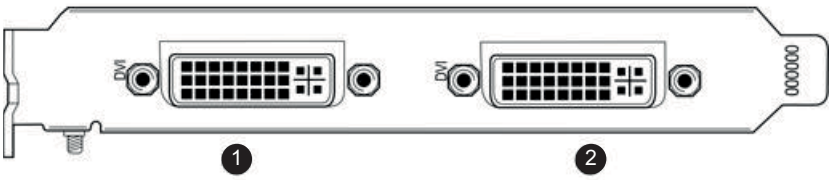


Image 2-5
MXRT-5450 & MXRT-5550

1. Head 1- DVI-I Connection
2. Head 2- DVI-I Connection

IO-Panel for the Barco MXRT-4500, MXRT-5400, MXRT-5500 & MXRT-7400

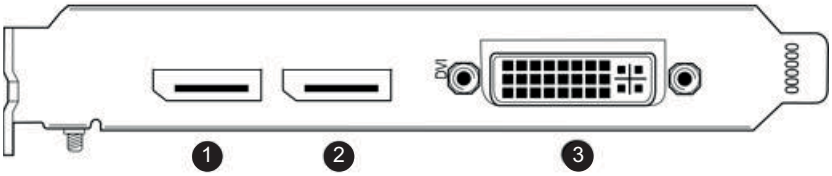


Image 2-6
MXRT-4500, MXRT-5400, MXRT-5500 & MXRT-7400

1. DisplayPort #1
2. DisplayPort #2
3. DVI-I

IO-Panel for the Barco MXRT-7500

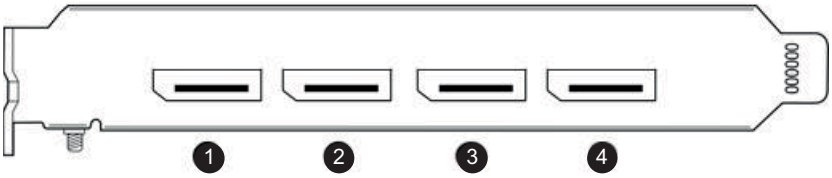


Image 2-7
MXRT-7500

1. DisplayPort #1
2. DisplayPort #2
3. DisplayPort #3
4. DisplayPort #4

For displays with native DisplayPort input, use a native DisplayPort cable to connect the DisplayPort output of the Display Controller to the DisplayPort input of the display. You cannot connect the DVI output of a Display Controller to the DisplayPort input of a display.

3. DONGLES

Barco dongles are specially designed to allow Barco Display Controllers with a DisplayPort output to be connected with a display with DVI input.

If video cable conversion is not required, you may bypass this section.

3.1 Passive Single-Link Dongle

Passive Single-Link

The passive Single-Link Dongle allows you to connect a display's DVI input to the DisplayPort output of your Barco Display Controller. It is compatible with all Barco grayscale displays and up to 2MP color models. For color displays of 3MP and greater resolutions, the Dual-Link Dongle is necessary.

All Barco Display Controllers compatible with the DisplayPort interface come with a Single-Link Dongle by default.

Image 3-1
Single-Link dongle (supplied with system)

1. To display (Single-Link DVI)
2. To DisplayPort connector on Barco Display Controller

3.2 Active Single-Link Dongle

Active Single-Link

Barco Display Controllers are not compatible with active single-link dongles. Please use the passive dongles that are included with your Barco Display Controllers.

3.3 Dual-Link Dongle

Dual-Link

The active Dual-Link Dongle also converts DisplayPort input signals to DVI output signals. However, unlike the passive Single-Link dongle, the Dual-Link dongle allows higher resolutions (greater than 1920x1200) on color displays.

WARNING: A Dual-Link DVI cable must be used to connect your display's DVI connector with the DVI connector on the Dual-Link Dongle.

The Dual-Link dongle is ordered separately.

How to install the Dual-Link Dongle

Use the following steps to install the dongle:

1. Connect the DisplayPort end of the connector to the Display Controller.

Image 3-2
Dual-Link dongle (ordered separately)

1. To computer's USB port
2. To display (DVI Dual-Link)
3. To DisplayPort connector on Barco Display Controller

2. Plug in a Dual-Link DVI cable from the display to the DVI port of the dongle.
3. Connect the built-in USB power cable on the dongle to a workstation USB port.
4. If you are using QAWeb Agent version 1.10.2 or older, a separate software component is required for supporting DDC communication through the Dual-Link dongle. Run setup.exe from Barco_DLDP2DVI_Install package after driver installation to install the SW.

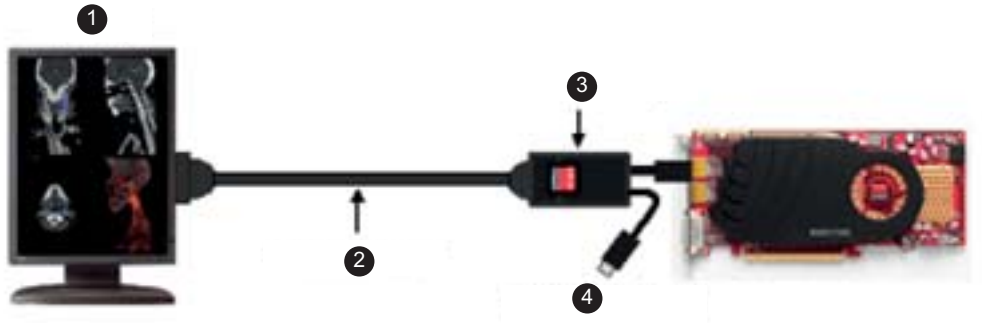


Image 3-3
Dual-Link Dongle installation

1. Up to 3MP color
2. 9’ Barco DVI cable
3. Dual-Link DP to DVI adapter
4. USB power connector

3.4 Common cases

MXRT-2400 & MXRT-2500

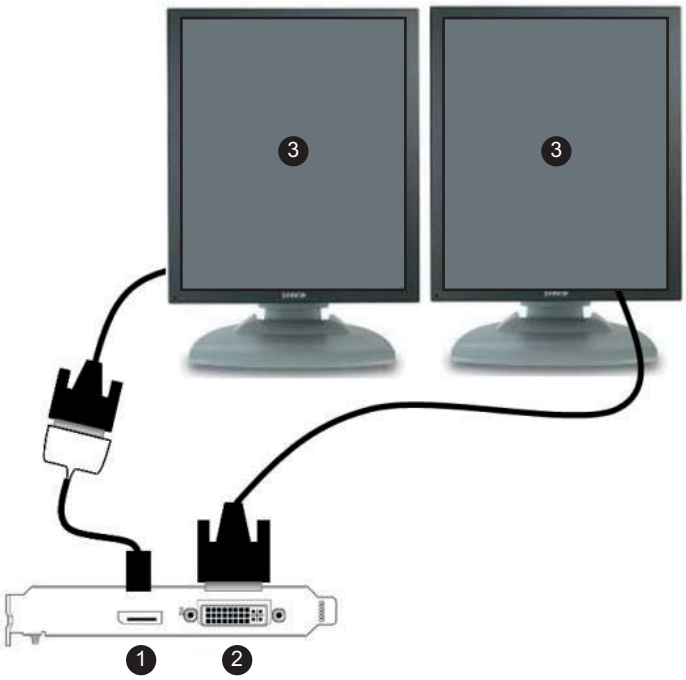


Image 3-4
All grayscale or 2MP color diagnostic displays

1. DisplayPort connection with single-link dongle
2. DVI-I connection
3. Grayscale diagnostic display or Color 2MP diagnostic display

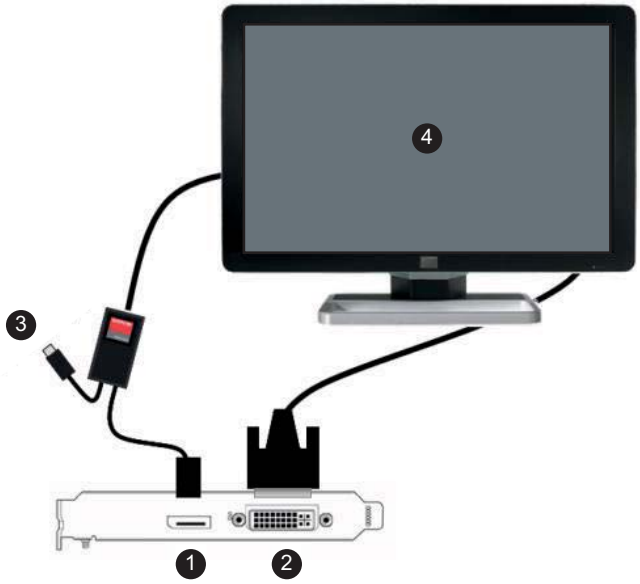


Image 3-5
DVI 6MP Color Diagnostic display or 3MP Color display

1. DisplayPort connection with dual-link dongle
2. DVI-I connection
3. USB power to computer
4. DVI 6MP Color Diagnostic display or 3MP Color display

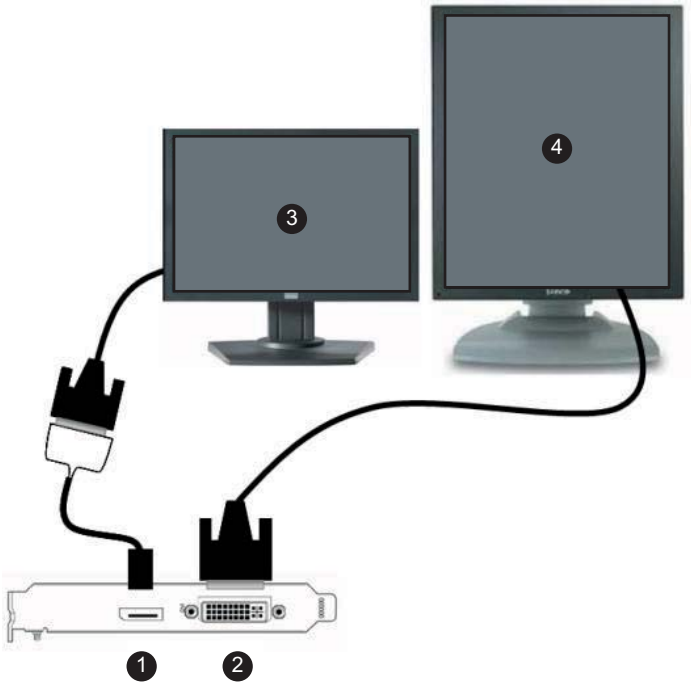


Image 3-6
DVI Color Navigation display and any Grayscale or 2MP Color Diagnostic display

1. DisplayPort connection with single-link dongle
2. DVI-I connection
3. DVI Color Navigation display
4. Grayscale or 2MP Color Diagnostic display

MXRT-4500, MXRT-5400, & MXRT-5500

DVI Navigation display and all Grayscale or 2MP Color Diagnostic displays

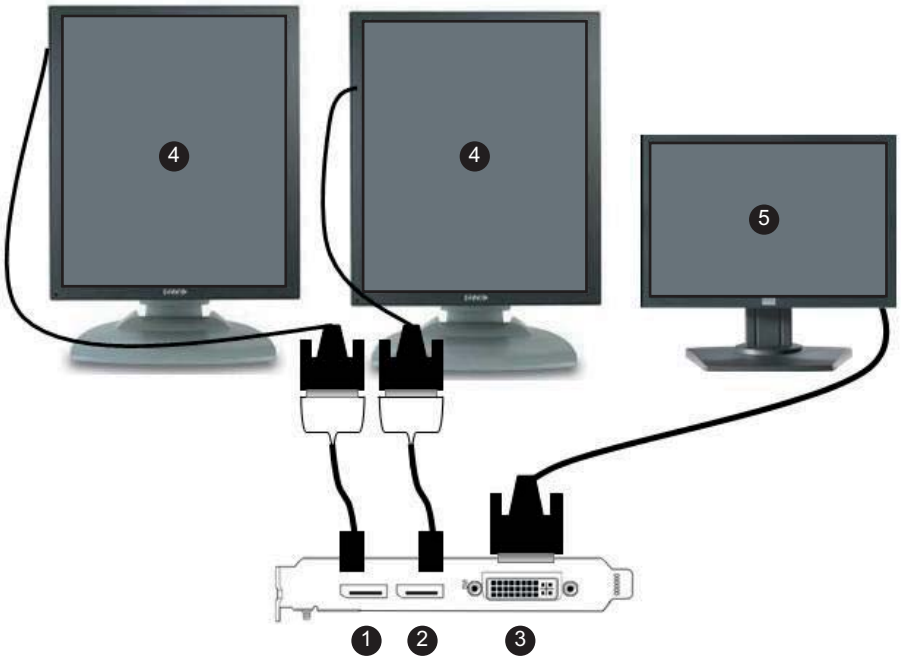


Image 3-7
DVI Navigation display and all Grayscale or 2MP Color Diagnostic displays

1. DisplayPort with single-link dongle
2. DisplayPort with single-link dongle
3. DVI-I
4. Grayscale Diagnostic display or 2MP Color Diagnostic display
5. Color Navigation display

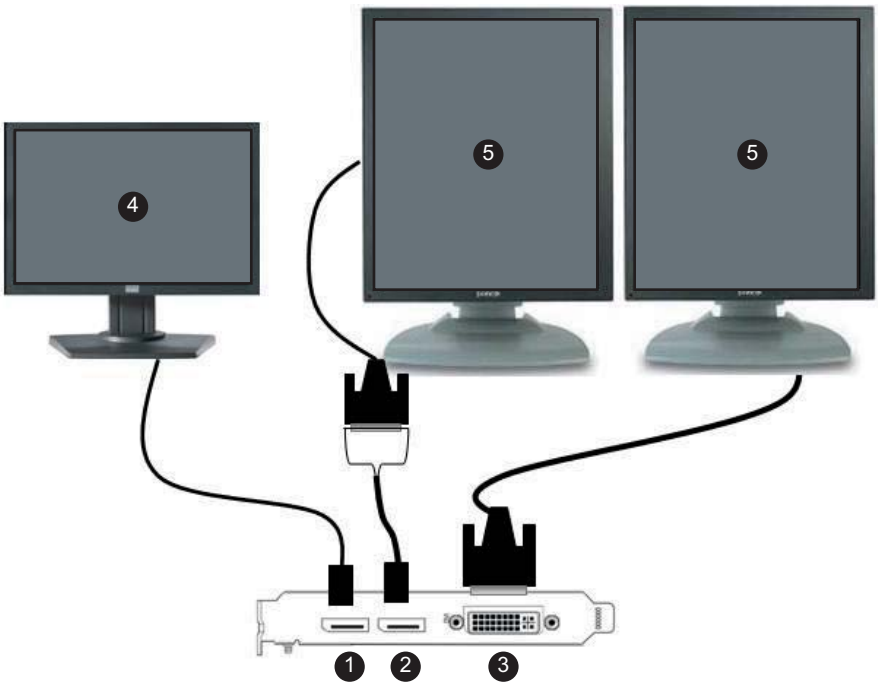


Image 3-8
DisplayPort Navigation display and all Grayscale or 2MP Color Diagnostic displays

1. DisplayPort #1
2. DisplayPort connection with single-link dongle
3. DVI-I
4. Color Navigation display
5. Grayscale Diagnostic display or 2MP Color Diagnostic display

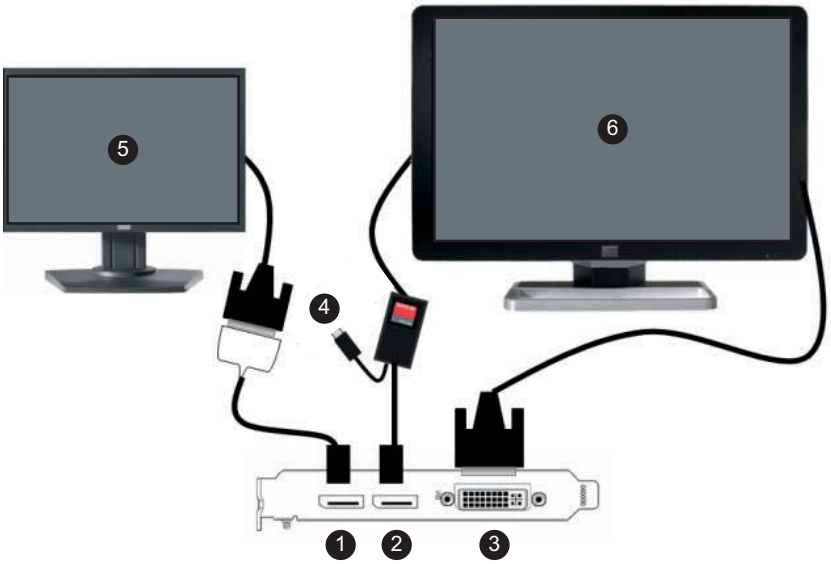


Image 3-9
DVI Navigation display and 6MP Color Diagnostic display or 3MP Color displays

1. DisplayPort connection with single-link dongle
2. DisplayPort connection with dual-link dongle
3. DVI-I
4. USB power to computer
5. Color Navigation display
6. 6MP Color Diagnostic display or 2 x 3MP Color displays

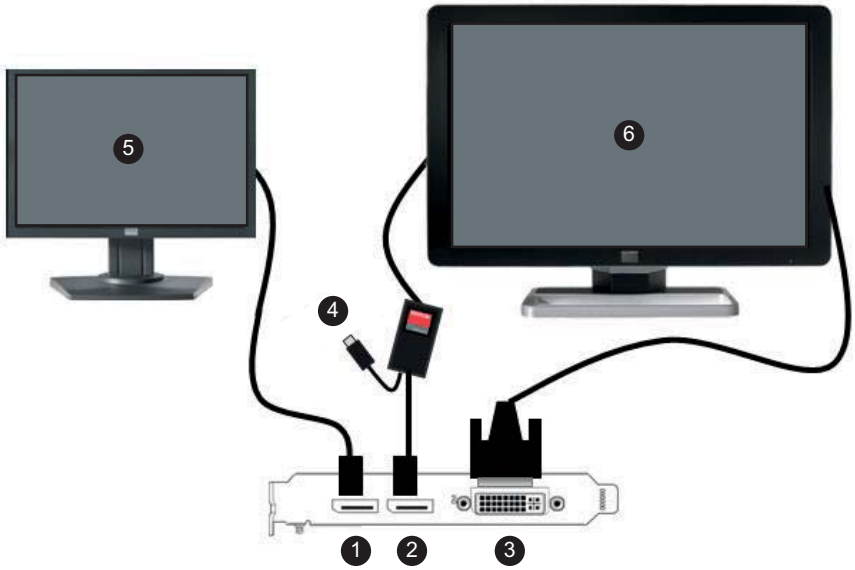


Image 3-10
DisplayPort Navigation display and 6MP Color Diagnostic display or 3MP Color displays

1. DisplayPort #1
2. DisplayPort connection with dual-link dongle
3. DVI-I
4. USB power to computer
5. Color Navigation display
6. 6MP Color Diagnostic display or 2 x 3MP Color displays

MXRT-7400

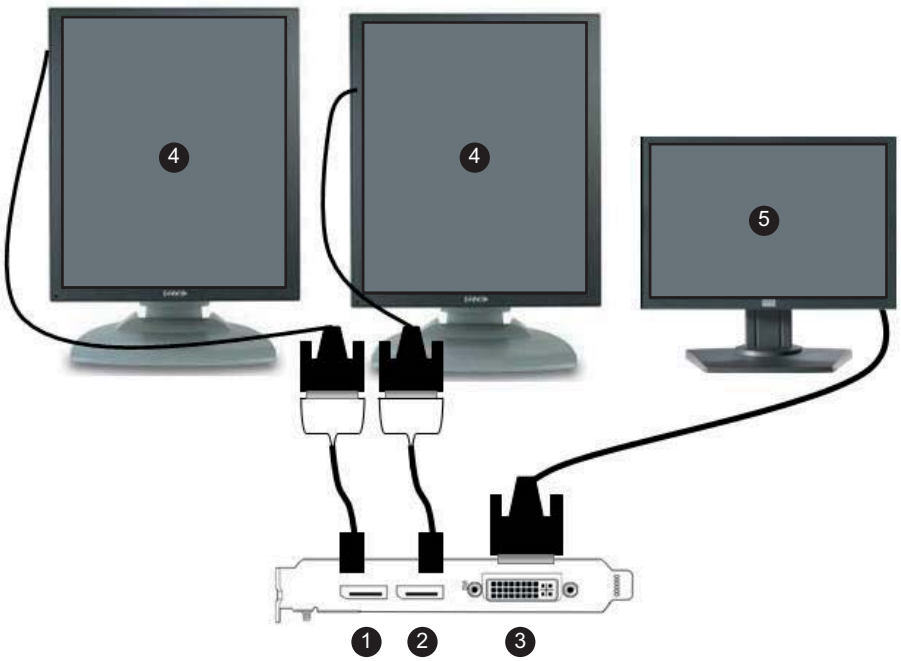


Image 3-11
DVI Navigation display and all Grayscale or 2MP Color Diagnostic displays (see Tip)

1. DisplayPort connection with single-link dongle
2. DisplayPort connection with single-link dongle
3. DVI-I
4. Grayscale Diagnostic display or 2MP Color Diagnostic display
5. Color Navigation display

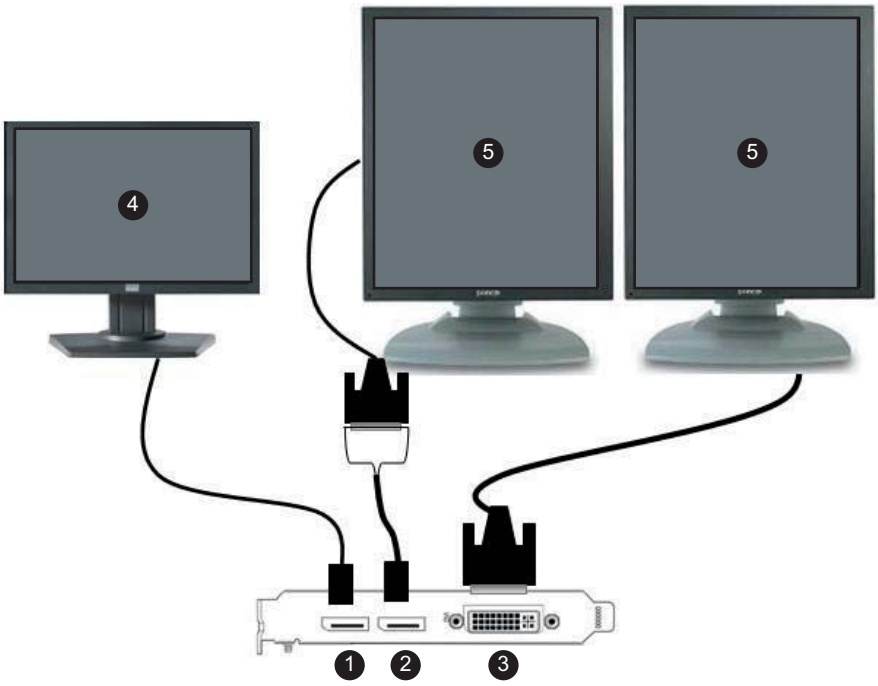


Image 3-12
DisplayPort Navigation display and all Grayscale or 2MP Color Diagnostic displays (see Tip)

1. DisplayPort #1
2. DisplayPort connection with single-link dongle
3. DVI-I
4. Color Navigation display
5. Grayscale Diagnostic display or 2MP Color Diagnostic display

Diagnostic displays must have matching resolutions.

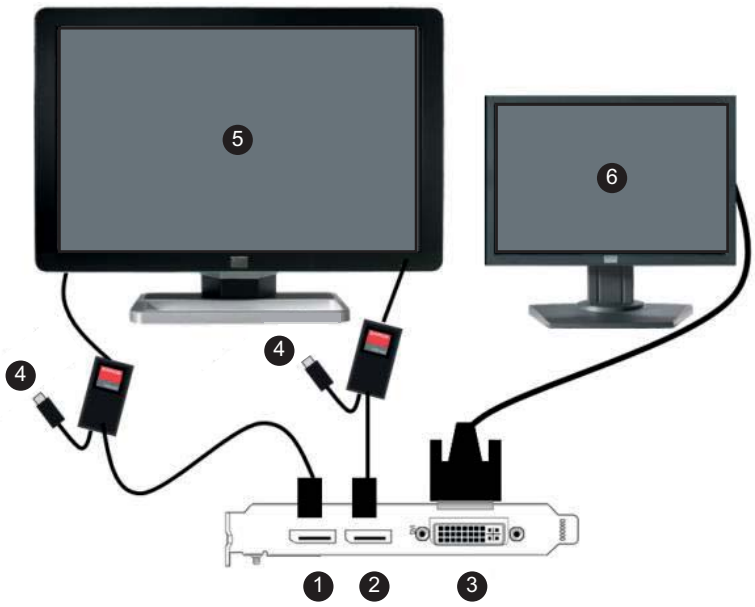


Image 3-13
DVI Navigation display and 6MP Color Diagnostic display or 3MP Color displays

1. DisplayPort connection with dual-link dongle
2. DisplayPort connection with dual-link dongle
3. DVI-I
4. USB power to computer
5. 6MP Color Diagnostic display or 2 x 3MP Color displays
6. Color Navigation display

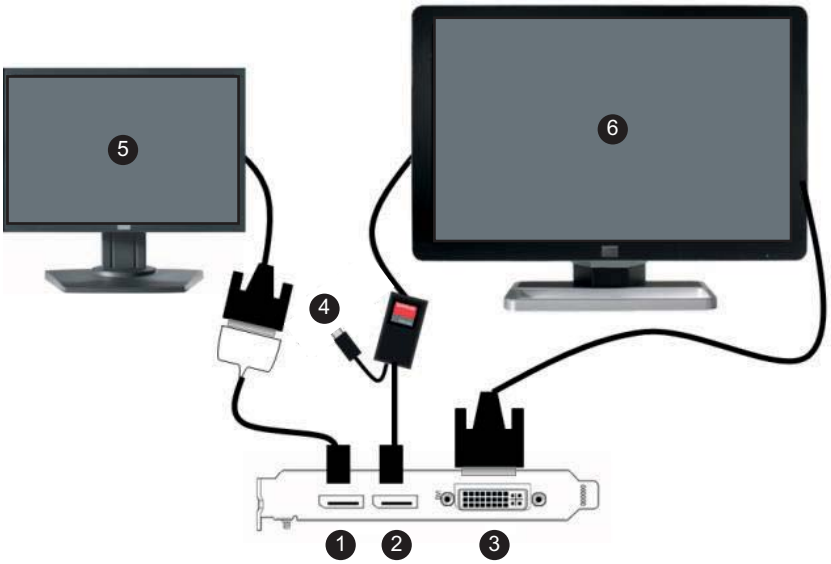


Image 3-14
DisplayPort Navigation display and 6MP Color Diagnostic display or 3MP Color displays

1. DisplayPort connection with single-link dongle
2. DisplayPort connection with dual-link dongle
3. DVI-I
4. USB power to computer
5. Color Navigation display
6. 6MP Color Diagnostic display or 2 x 3MP Color displays

MXRT-7500

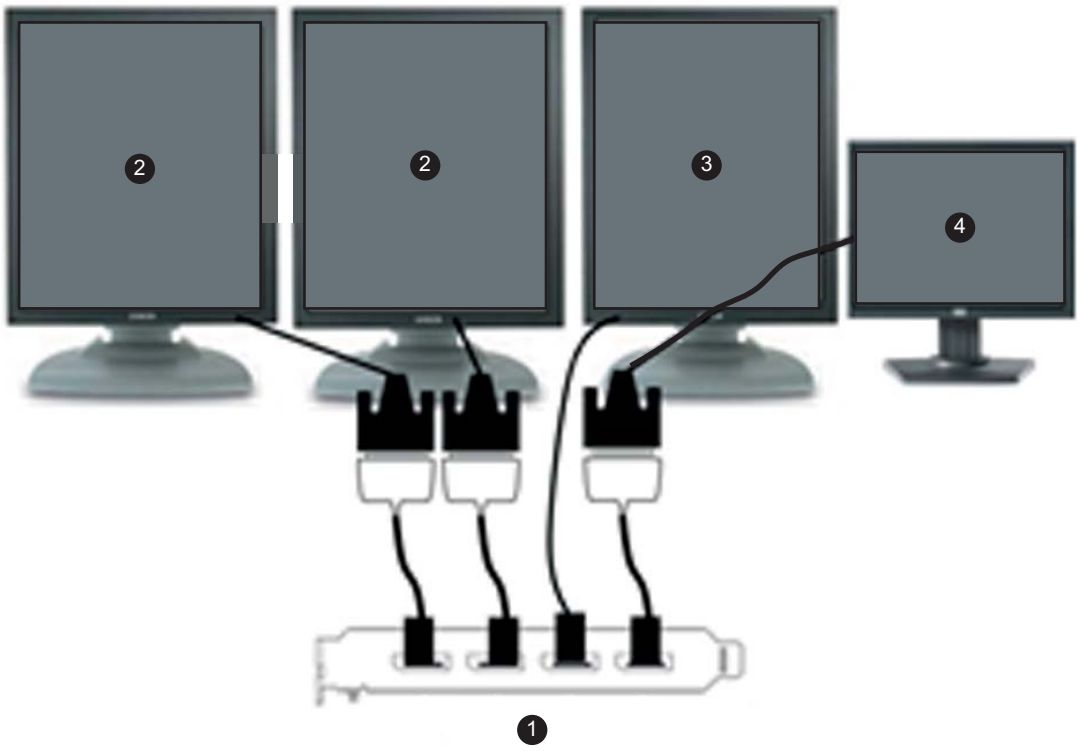


Image 3-15
DVI Navigation display and Dual-head DVI Grayscale displays with an optional DisplayPort 3D display (see Tip).

1. DisplayPort #1 through #4
2. Grayscale Diagnostic display (DVI)
3. 3D Display (DP): this is optional
4. Color Navigation display

The Grayscale Diagnostic displays must have matching resolutions.

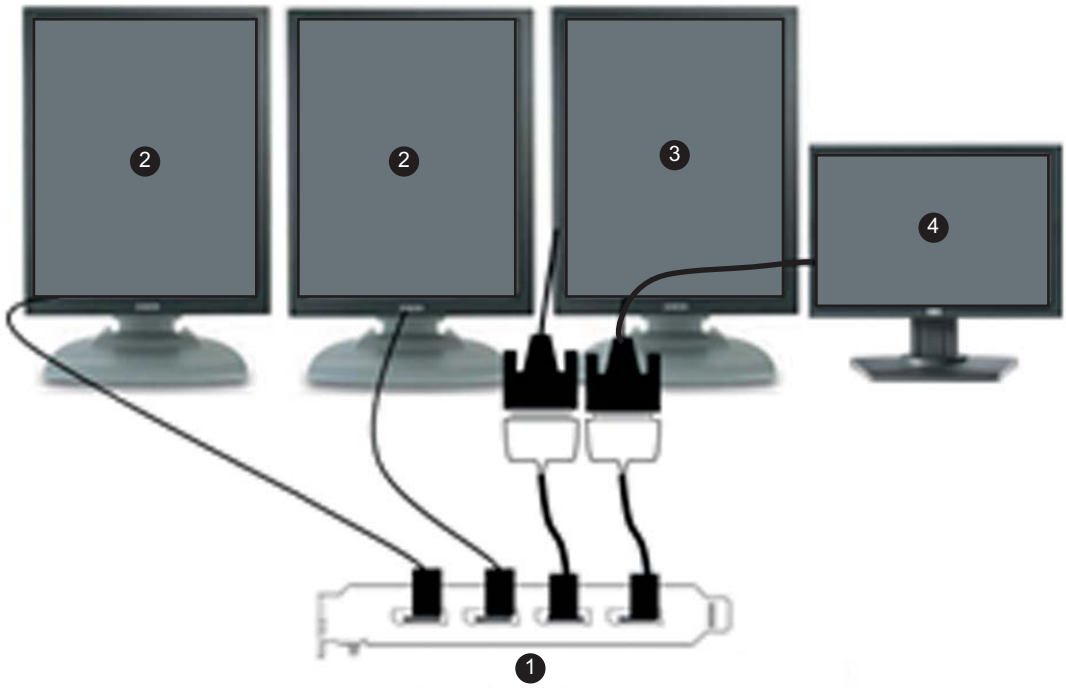


Image 3-16
DVI Navigation display and Dual-head DisplayPort Grayscale displays with an optional DVI 3D display

1. DisplayPort #1 through #4
2. Grayscale Diagnostic display (DP)
3. 3D Display (2MP Color DVI): this is optional
4. Color Navigation display

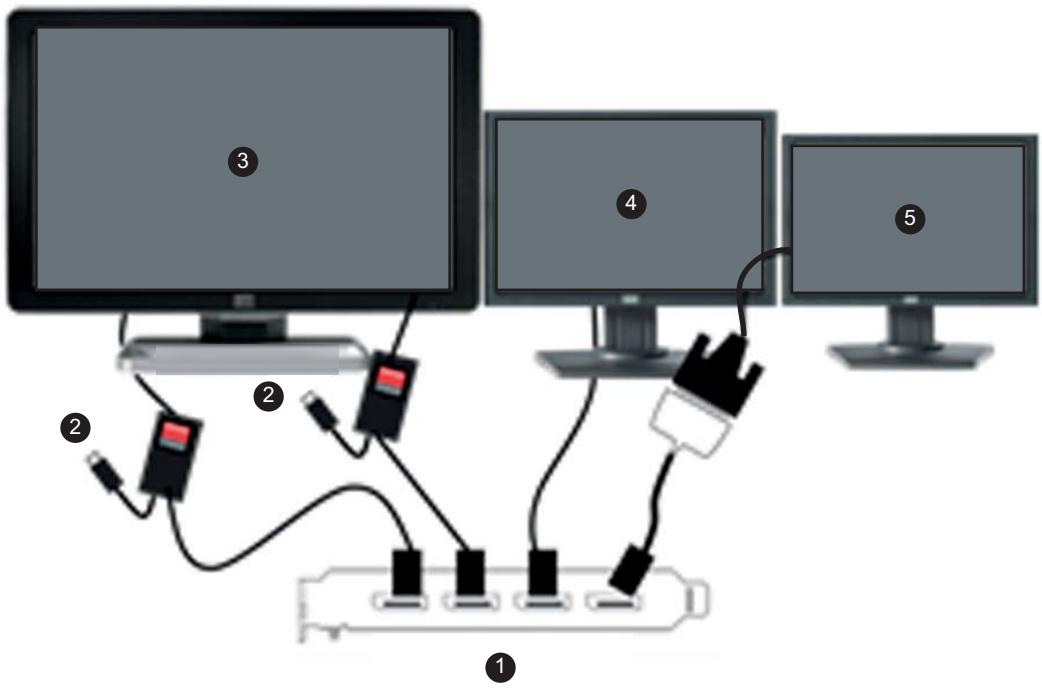


Image 3-17
DisplayPort Navigation display and DVI 6MP Color Diagnostic display or 3MP Color displays with an optional third DVI display

1. DisplayPort #1 through #4
2. USB power to computer
3. 6MP Color Diagnostic display or 2 x 3MP Color Diagnostic DVI (e.g. MDCC-6130)
4. Color Navigation display (DP)
5. Color Navigation display (DVI): this is optional

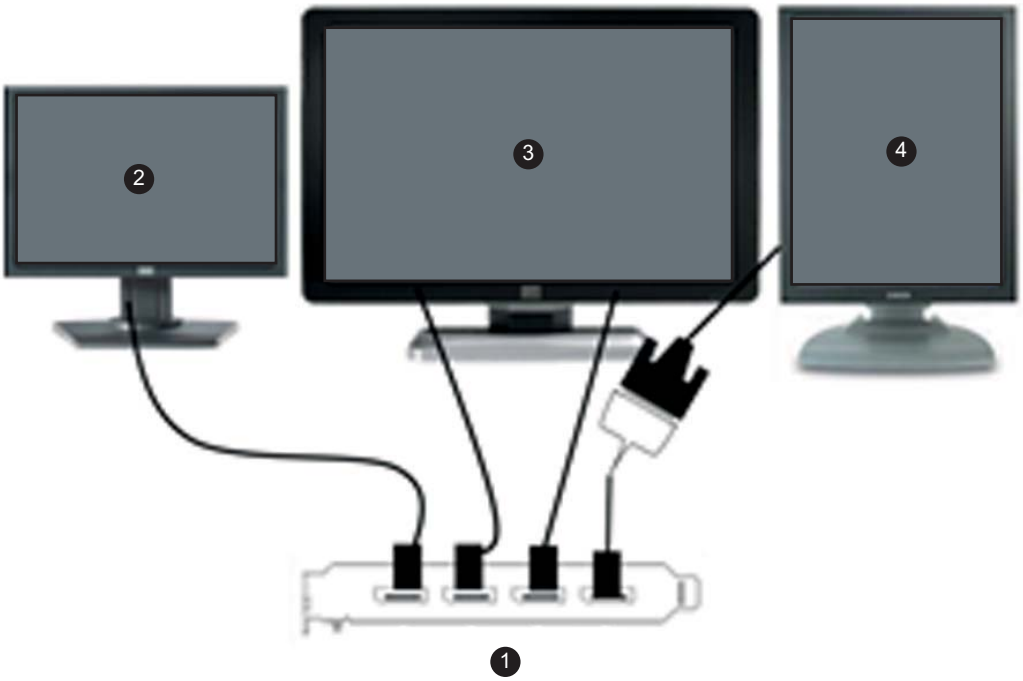


Image 3-18
DisplayPort Navigation display and DisplayPort 6MP Color Diagnostic display or 3MP Color displays with an optional DVI 3D display

1. DisplayPort #1 through #4
2. Color Navigation DP display (e.g. MDRC-2124)
3. 6MP Color Diagnostic display or 2 x 3MP Color Diagnostic DP display (e.g. MDCC-6230)
4. 3D Display (2MP Color DVI): this is optional

4. DRIVER AND SOFTWARE INSTALLATION

4.1 Driver and software installation prerequisites

Prerequisites

To install or remove the drivers, software, or documentation you must be logged on as a user with administrator privileges.

Your operating system must be installed and running before you can install the driver, software and documentation for the Barco Display Controller(s) for your Barco Display System.

Before you begin, make sure that all of your Barco Displays are connected to the appropriate Display Controller(s) in your system.

4.2 Installing the Barco MXRT drivers and software

Introduction

This chapter will guide you through the installation of the drivers, software and documentation associated with your Barco Display System or Barco Display Controller(s).

The installation dialog will display in English if your operating system's language is not supported.

This process applies to the following versions of Windows:

- Windows 7 32-bit
- Windows 7 64-bit
- Windows 8.1 32-bit
- Windows 8.1 64-bit

For optimal system performance, Barco recommends installing no more than two drivers on a system at one time. If the configuration will require three drivers, the Barco Driver Installer will alert the user to replace one board to eliminate one of the drivers.

You will need to install the Barco Display Controller system drivers and software in the following cases:

- After you have installed the Barco Display Controller(s) for your Barco Display System in your system for the first time.
- After you have reinstalled or upgraded your operating system.
- When you upgrade to a newer version of the MXRT driver and software.
  You do not need to manually uninstall an existing driver before updating to the current version. The Barco Product Installation Wizard will detect any prior installations and start the uninstallation process automatically if necessary.
  If you have a previous version of Conference CloneView application installed in the system, you need to terminate the application prior to installing the new version. To do so, bring up **Barco Clone Display(s)** configuration window, select **Stop Cloning**, and close the window.
  When there is a non-Barco board in the system, we recommend that you first install the driver for the non-Barco board before installing the Barco driver.
  After each driver installation, you should reboot the system before proceeding with the installation of another driver.

Installation procedure

The following will guide you through the installation procedure:

1. Start your system. If you have a fresh OS installation, or you have uninstalled an existing driver, the OS may automatically install an inbox driver from the Windows 7 driver store, either an AMD driver or a standard VGA driver, for the Barco Display Controller(s).
   If this occurs, the OS prompts you to restart your computer, click **Yes** to allow the automatic driver installation to complete and reboot the system.
2. Launch the Barco Product Installation Wizard. The installation Wizard should start automatically when you insert the Barco Display System Installation DVD into your computer's DVD drive. If the installation does not start, in the "auto play" window, click **Run setup.exe**.
3. To accept the installation of default software components, click on **Next**. To custom select software components, click on **Select Software Components** and the following screen will appear, allowing selection of individual components.

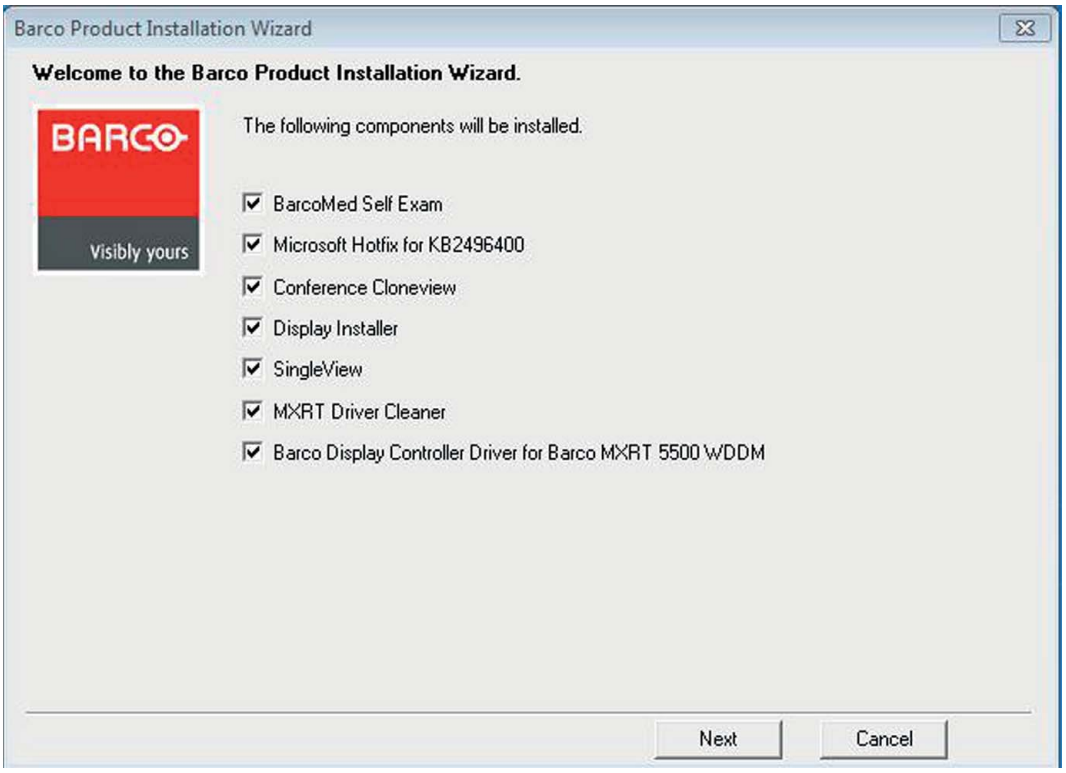


Image 4-1
Software component options for custom installation

- MXRT driver(s)
- BarcoMed Self Exam: Barco diagnostic tool
- QAWebAgent: Barco calibration software2
- SingleView: This application is required to configure Barco Fusion displays into SingleView mode or back into DualView mode. In SingleView, the display has a single landscape resolution, and in DualView, it has two side-by-side portrait resolutions.
- Conference CloneView: An application that allows the user to clone 1 or 2 displays to a third display, such as a projector.
- Driver Cleaner: An application that will remove all Barco software components from your workstation.
- Display Installer: This file allows Windows to recognize Barco displays.
- Microsoft Hotfix for KB2496400: Resolved the issue that monitor configuration is lost after you restart a computer that is running Windows 7.
  In a configuration that includes an MXRT-1150/2150 and other MXRT boards, two separate drivers will be installed. The master installation program will make two passes through the driver installation process (i.e. License Agreement, Verify Installation Options, etc.).

4. If a previous installation of an MXRT driver exists, the installation wizard will detect it and guide you through the uninstallation process if necessary.
5. Click **Yes** to accept the driver's License Agreement, and then **Next** to continue.
6. You will be prompted for Express or Custom Installation. By default, the Express Install option is selected. Custom Installation prompts two installation options:
   - 30-bit Desktop: This option allows high dynamic range visualization of medical imaging on grayscale and color displays.
   - SingleView: This option sets all Barco Fusion displays into SingleView mode.
7. During installation, the desktop may flash, and the Installation Wizard window may appear on different displays. This is expected behavior.
8. When the installation of all components has completed, the automatic reboot window will be displayed. Allow the system to reboot.

4.3 After installation

Installation verification

To verify that the driver was installed, go to the **Windows Control Panel**, select **System**, select **Device Manager**, then select **Display Adapters**. Verify that Barco Display Controllers are properly identified, as shown below:

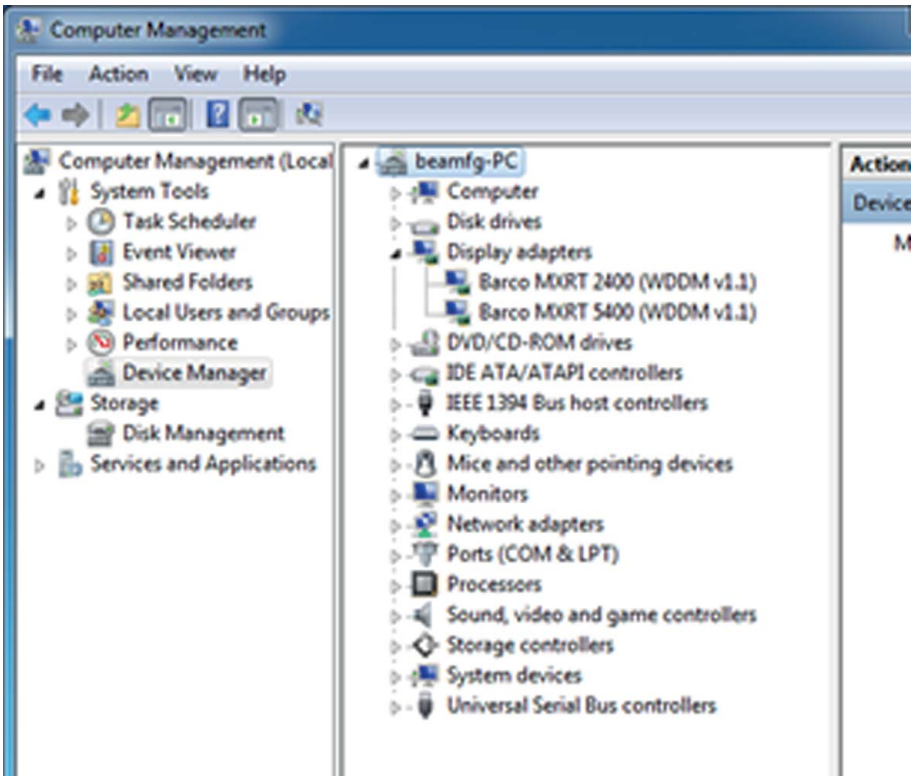


Image 4-2
Verifying driver installation

Automatic display configuration

Once the drivers, software and documentation have been installed and your system has been rebooted, the computer should automatically detect your Barco displays and attach them to the desktop with the correct resolution. If the computer fails to detect your Barco displays or fails to attach them to the desktop correctly, please use the **Windows Screen Resolution** to set the correct resolution.

Reinstalling drivers

You can install new drivers or reinstall existing drivers at any time by using the Barco Set-up wizard on your Barco Display System Installation DVD.

Uninstalling the drivers and software

To uninstall the Barco drivers, software or documentation for your Barco Display System, please use the **Windows Add/Remove Programs**. This can be found in the **Windows Control Panel** under **Programs & Features**.

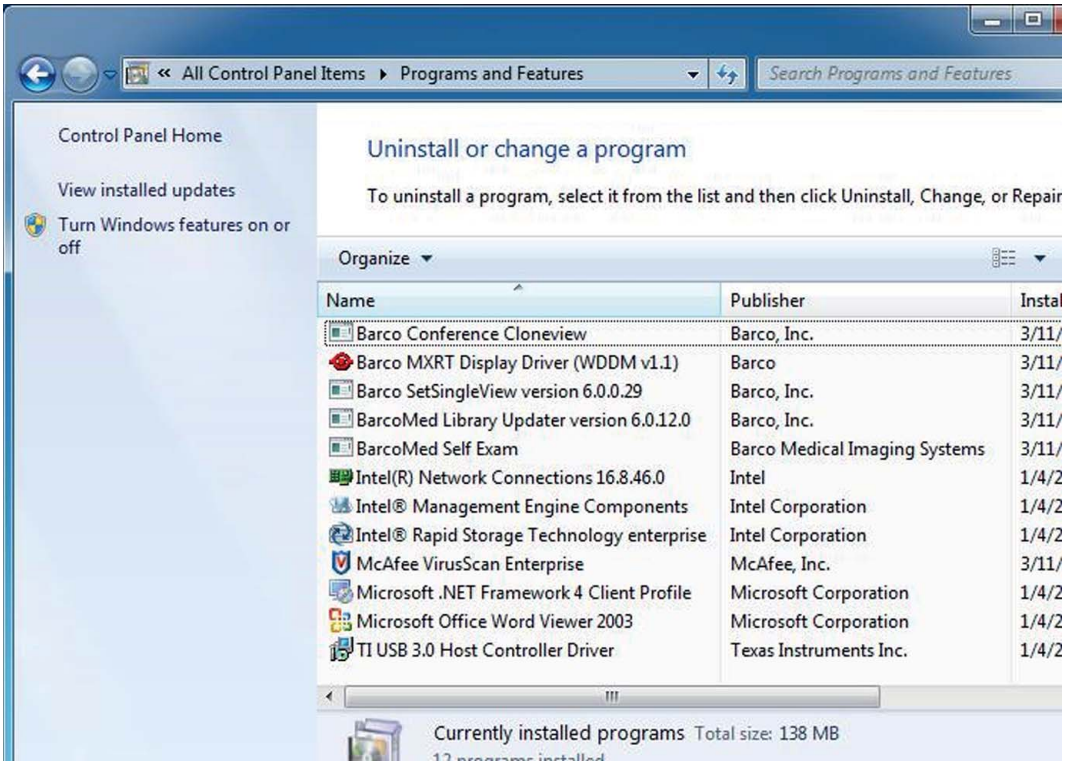


Image 4-3
Windows 7 Add/Remove Programs

When uninstalling the Barco MXRT drivers, the following dialog box will appear. Select the driver listed you wish to install (driver version may be different than what is pictured below).

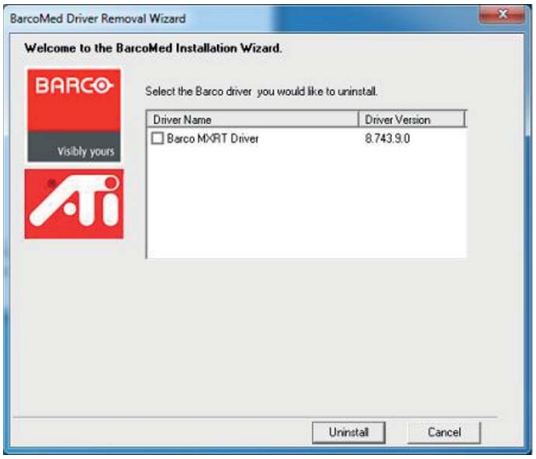


Image 4-4
Barco MXRT Driver Removal Wizard

Driver Cleaner

The **Barco Driver Cleaner** is a tool that will remove all Barco software components from your workstation. The application and its user guide can be found at C:\program files\Barco.

4.4 Silent installation of drivers and software

Pre-installation

Once a Barco driver has been pre-loaded into the driver store of a Windows 7 OS, subsequent installation of the driver will be intervention-free.

To pre-load the driver software into the driver store, open a command shell and navigate to the appropriate driver directory and run the PnPUtil application with the -a "add" parameter. For example:

```
cd d:\Barco\drivers\VS32\MXRT
```

```
pnputil -a *.inf
```

The PnPUtil application will parse the inf files and add the MXRT drivers to the driver store.

If this is the first installation of a Barco driver, the trust prompt will ask whether you really want to install the driver. Check the box that says **Always trust software from Barco** and press **OK**. The PnPUtil application will confirm the driver is loaded into the driver store.

At this point you can change to another directory and repeat this with other drivers. You will not see the trust prompt.

If you install using wildcards, you may see an error message that the Autorun.inf was not in an expected format. This message is normal and can be ignored.

When you have added all of the drivers that you will need to the driver store, you can create an image of the drive, and use it for staging additional systems. All of the systems with this driver store are set up for intervention-free silent installation.

Silent installation

For silent installation, first import the Barco published certificate into the certificate store. This certificate can be extracted from the driver catalog file located in the driver package. Please note that the certificate changes overtime, so we recommend extracting the current one each time.

Once imported, navigate to the Barco installation folder and execute the command `setup.exe -silent`. This can be done from the command shell, from the Run command, or from a command shortcut. The setup program will automatically install the drivers for any BarcoMed or MXRT boards that are present, the BarcoMed Self Exam program, and QAWeb (if part of the installation package).

Configure silent install options

You can modify the setup.ini file at the Barco root folder to customize some silent install options. The configurable options are listed in the [Custom] section of the setup.ini file.

SimplifiedFinishPage:

- If set to Yes, only the Finish button appears on the final installation page.
- If No (default), reboot buttons and show document check boxes are also shown.

Reboot:

- If set to Yes (default), the installer will prompt the user or launch a timer to reboot following software installation.
- If No, the prompt/timer is not shown.

DisableCalibrationSoftwareText:

- If set to Yes (default), QAWeb software is installed.
- If No, the user can select installation of either QAWeb and/or MediCal Pro, if present.

IgnoreInstallFailureOnReboot:

- If set to Yes, the system will disregard any installation failures and proceed to auto-reboot.
- If No (default), the auto-boot is disable if installation failures are detected.

DisableQAWebScripts:

- If set to Yes, QAWeb will auto-start.
- If No (default), scripts will prevent QAWeb from launching until after the reboot.

NeverForceUninstall:

- If set to Yes, the installer will not require the user to uninstall previous Barco drivers.
- If No (default), the installer prompts the user to uninstall pre-existing drivers.

5. CONFIGURING WINDOWS

5.1 Configuring SingleView

How to configure SingleView

1. From the Start Menu, select **All Programs**.
2. Under the Barco Programs folder, select the desired configuration:

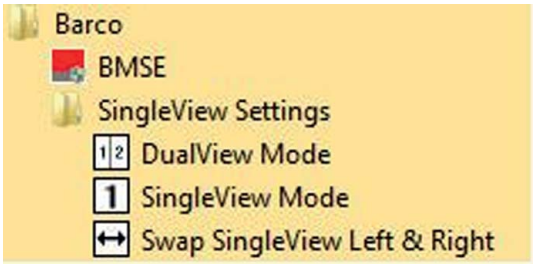


Image 5-1
SingleView Start Menu options

When your Fusion display is configured in SingleView mode, it is possible that the left and right sides of the image are not in the correct order. In this case, click on the Swap SingleView Left & Right option, and it will adjust the heads on the desktop.

5.2 Configuring Barco Displays with the Windows Display Control Panel

How to display the Windows desktop

1. Right click on the desktop, and select **Screen resolution**.
2. From the Windows Display Control Panel, highlight the Barco display whose mode you wish to set, and select **Advanced settings**.
3. In the **Adapter** tab of the Advanced settings dialog box, click on the **List All Modes** button.
4. Select the resolution and refresh rate that your Barco Display Controller supports from the dialog box and click **OK**.
5. Click **OK** on the bottom of the Adapter control panel.
6. Click **Yes** in the “Do you want to keep these display settings?” dialog box. Your Barco Display Controller should now synchronize and display the Windows desktop.

5.3 Configuring software rotation

How to change your screen orientation

Software rotation is only necessary for displays that do not support hardware rotation, such as MDRC displays and some third party displays.

1. Right click on the Desktop, and select **Screen Resolution** in the context menu.

2. Select a Display.
3. In the **Orientation** drop down list, these options are available:
   - Landscape (no rotation)
   - Portrait (rotate 90 degrees)
   - Landscape (flipped)
   - Portrait (flipped)
4. Select the desired setting, and click **Apply**.

6. CONFERENCE CLONEVIEW

6.1 What is Conference CloneView ?

Overview

This application allows the user to clone outputs from 1 or 2 displays to a third display or projector attached to the same Display Controller. The cloned image will be scaled to fit the resolution of the target display. The application supports zooming and panning for ease of viewing.

Supported Display Controllers

MXRT-1450 & MXRT-1451, MXRT-2400, MXRT-2500, MXRT-4500, MXRT-5400, MXRT-5450, MXRT-5500, MXRT-5550, MXRT-7400 & MXRT-7500.

6.2 Configuration

How to configure your display(s)

1. Start the **Conference CloneView** application either from the desktop icon or from **Start** -> **Programs** -> **Barco**, this will display the configuration window.
2. Select the Display Controller that is connected to the display(s) you would like to clone from the drop down list. You can only clone displays connected to the same Display Controller. Click on **Identify** to see the displays connected to the currently selected Display Controller.
3. Select up to two source display(s) to clone from, and the target display where the cloned image will display, and click on the **Create Clone** button. By default, the source image(s) will be downscaled to fit the cloned display, while maintaining the original aspect ratio. Select **Stretch to fill** to stretch the cloned image to fit the cloned display's resolution, ignoring aspect ratio.
4. Once all desired cloning has been configured, you may close the configuration window. The selected cloning configuration will persist during reboots until the user elects to stop cloning.
5. To stop cloning, click on the **Stop Cloning** button in the configuration window. Alternatively, right click on the cloned display and select **Stop Cloning** from the context menu.

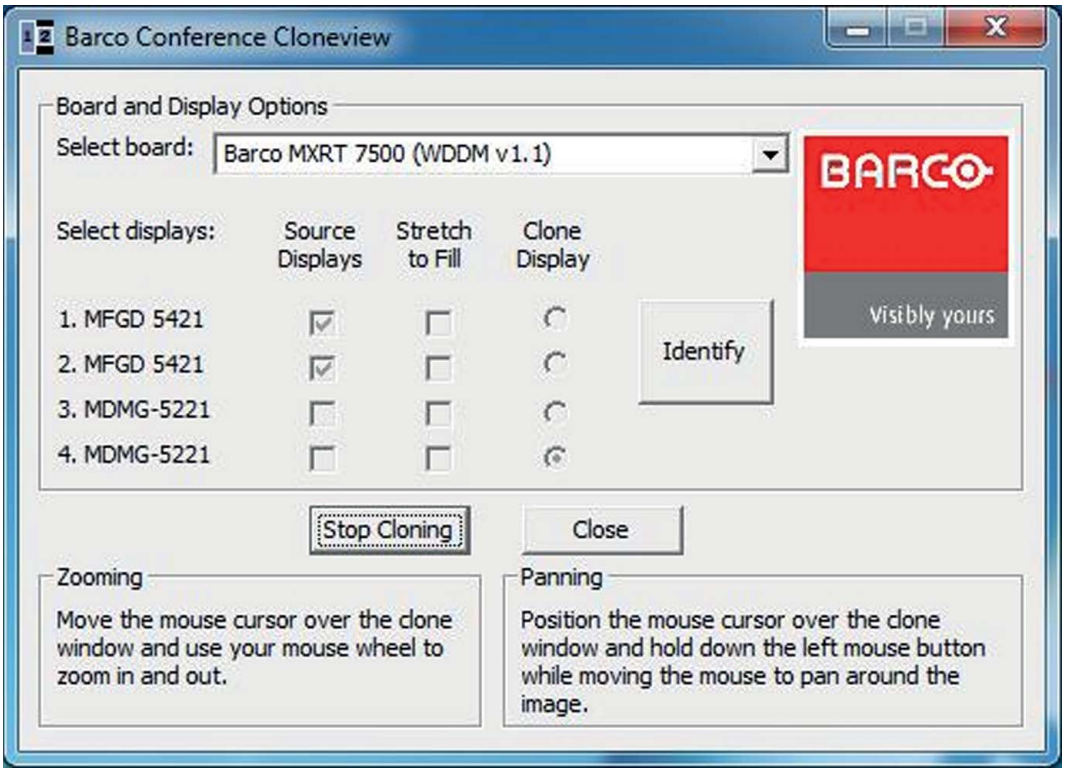

Barco Conference Cloneview
Board and Display Options
Select board:
Barco MXRT 7500 (WDDM v1.1)
BARCO
Visibly yours
Select displays:
Source Displays
Stretch to Fill
Clone Display
1. MFGD 5421
2. MFGD 5421
3. MDMG-5221
4. MDMG-5221
Identify
Stop Cloning
Close
Zooming
Move the mouse cursor over the clone window and use your mouse wheel to zoom in and out.
Panning
Position the mouse cursor over the clone window and hold down the left mouse button while moving the mouse to pan around the image.

Image 6-1
Conference CloneView configuration window

6.3 Notification icon

System tray

The Conference CloneView notification icon is available in the **system tray** once the Conference CloneView application has been launched. Right clicking on the icon offers the following menu options:

Image 6-2
Conference CloneView notification icon

1 Notification icon

- **Show GUI**: This launches the configuration window.
- **Start when Windows starts**: When checked, the clone configuration is restored upon every reboot.
- **Pause cloning**: This will stop updating the cloned images on each cloned display, essentially freezing the current images. Uncheck this to continue live updates.
- **Exit**: This stops the application. To restart it, launch the Conference CloneView application from the Start Menu.

6.4 Tools available on the cloned display

When the mouse cursor is over to the cloned image, it will change to a different shape and the following control options are available:

Zooming and panning

The user can zoom in on the cloned image by rolling the mouse cursor wheel.

When zoomed in, the cloned image may be bigger than the clone display and part of the image may be off screen. Click and hold the left mouse button and move the cursor to pan to the portion of the image that is off screen.

Clone display menu options

Right clicking on the cloned image will bring up the Conference CloneView context menu.

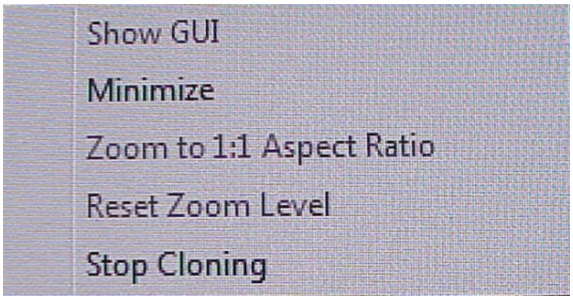


Image 6-3
Conference CloneView context menu

Menu options:

- **Show GUI**: This option launches the configuration window. When the configuration window is already shown, this option is grayed out.
- **Minimize**: This minimizes the cloned image to show the desktop.
- **Zoom to 1:1 Aspect Ratio**: When ”Stretch to fill” is selected in the configuration window, the aspect ratio of the cloned image may not match the source. Select this option to zoom directly to a 1:1 aspect ratio. When ”Stretch to fill” is not selected, this option is grayed out.
- **Reset Zoom Level**: Select this option to return to the minimize zoom level. When the image is already at the minimum zoom level, this option is grayed out.
- **Stop Cloning**: Select this option to stop cloning on the current Display Controller. It has the same effect as clicking on the **Stop cloning** button in the configuration window.

7. IMPORTANT INFORMATION

7.1 Safety information

General recommendations

Read the safety and operating instructions before operating the device.

Retain safety and operating instructions for future reference.

Adhere to all warnings on the device and in the operating instructions manual.

Follow all instructions for operation and use.

Electrical Shock or Fire Hazard

To prevent electric shock or fire hazard, do not remove cover.

No serviceable parts inside. Refer servicing to qualified personnel.

Do not expose this apparatus to rain or moisture.

Modifications to the unit:

Do not modify this equipment without authorization of the manufacturer.

Type of protection (Electrical)

Device with external power supply: Class I equipment.

Degree of safety (flammable anesthetic mixture):

Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.

This Display Controller conforms to:

FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea).

7.2 Environmental information

Disposal Information

Waste Electrical and Electronic Equipment

This symbol on the product indicates that, under the European Directive 2012/19/EU governing waste from electrical and electronic equipment, this product must not be disposed of with other municipal waste. Please dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

For more information about recycling of this product, please contact your local city office or your municipal waste disposal service.

For details, please visit the Barco website at: http://www.barco.com/en/AboutBarco/weee

Turkey RoHS compliance

Türkiye Cumhuriyeti: AEEE Yönetmeliğine Uygundur.

[Republic of Turkey: In conformity with the WEEE Regulation]

中国大陆 RoHS (EXAMPLE)

Chinese Mainland RoHS

根据中国大陆《电子信息产品污染控制管理办法》(也称为中国大陆RoHS)，以下部分列出了Barco产品中可能包含的有毒和/或有害物质的名称和含量。中国大陆RoHS指令包含在中国信息产业部MCV标准：“电子信息产品中有毒物质的限量要求”中。

According to the “China Administration on Control of Pollution Caused by Electronic Information Products” (Also called RoHS of Chinese Mainland), the table below lists the names and contents of toxic and/or hazardous substances that Barco’s product may contain. The RoHS of Chinese Mainland is included in the MCV standard of the Ministry of Information Industry of China, in the section “Limit Requirements of toxic substances in Electronic Information Products”.

零件项目(名称) **Component name**	**有毒有害物质或元素** **Hazardous substances and elements**					
	铅 **Pb**	**汞** **Hg**	**镉** **Cd**	**六价铬** **Cr6+**	**多溴联苯** **PBB**	**多溴二苯醚** **PBDE**
印制电路配件 Printed Circuit Assemblies	x	o	o	o	o	o
O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下. O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363-2006.						
X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求. X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363-2006						

在中国大陆销售的相应电子信息产品(EIP)都必须遵照中国大陆《电子信息产品污染控制标识要求》标准贴上环保使用期限(EFUP)标签。Barco产品所采用的EFUP标签(请参阅实例，徽标内部的编号使用于制定产品)基于中国大陆的《电子信息产品环保使用期限通则》标准。

All Electronic Information Products (EIP) that are sold within Chinese Mainland must comply with the “Electronic Information Products Pollution Control Labeling Standard” of Chinese Mainland, marked with the Environmental Friendly Use Period (EFUP) logo. The number inside the EFUP logo that Barco uses (please refer to the photo) is based on the “Standard of Electronic Information Products Environmental Friendly Use Period” of Chinese Mainland.

7.3 Regulatory compliance information

FCC class B

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the device and receiver.
- Connect the device into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

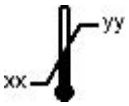
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

7.4 Explanation of symbols

Symbols on the device

On the device or power supply, you may find the following symbols (nonrestrictive list):

CE	Indicates compliance with the Directive 93/42/EEC as Class I device
CE 0120	Indicates compliance with the Directive 93/42/EEC as Class II device
FC	Indicates compliance with Part 15 of the FCC rules (Class A or Class B)
CLASSIFIED UL	Indicates the device is approved according to the UL regulations
CLASSIFIED C UL US	Indicates the device is approved according to the UL regulations for Canada and US
D	Indicates the device is approved according to the UL Demko regulations
CCC	Indicates the device is approved according to the CCC regulations

	Indicates the device is approved according to the VCCI regulations
	Indicates the device is approved according to the KC regulations
	Indicates the device is approved according to the BSMI regulations
	Indicates the USB connectors on the device
	Indicates the DisplayPort connectors on the device
	Indicates the manufacturing date
	Indicates the temperature limitations[3] for the device to safely operate within specs
	Indicates the device serial no.
	Warning: dangerous voltage
	Caution
	Consult the operating instructions
	Indicates this device must not be thrown in the trash but must be recycled, according to the European WEEE (Waste Electrical and Electronic Equipment) directive
	Indicates Direct Current (DC)
	Indicates Alternating Current (AC)
	Stand-by
	Equipotentiality

3. Values for xx and yy can be found in the technical specifications paragraph.

7.5 Legal disclaimer

Disclaimer notice

Although every attempt has been made to achieve technical accuracy in this document, we assume no responsibility for errors that may be found. Our goal is to provide you with the most accurate and usable documentation possible; if you discover errors, please let us know.

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Patent information (EXAMPLE)

This product is covered under the following intellectual property rights:

US Patent RE43,707

US Patent 7,038,186

US Patent 7,166,829

US Patent 6,950,098

European Patent 1 274 066.

7.6 Technical specifications

MXRT-1450

Product acronym	MXRT-1450
Bus compatibility	Could be installed within PCI Express x1, x8, x16 mechanical slots Works in PCI Express x1, x4, x8, x16 electrical slots / operates at x1 speed
Power consumption	17 Watt
Form factor	Low profile, half-length, 2.3”x 6.6”
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	512 MB DDR3
Memory interface	64-bit
Memory bandwidth	9.6 GB/s
Pixel depth	32-bit color
Electrical standard	Single-link DVI complying to v1.0 specification

Connectors	DMS-59
Connectivity	One DMS-59-to-DVI adaptor included
Supported resolutions	2560x1600 DisplayPort, 1920x1200 DVI/Analog
DirectX support	Microsoft® DirectX v11.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-1451

Product acronym	MXRT-1451
Bus compatibility	Could be installed within PCI Express x1, x8, x16 mechanical slots Works in PCI Express x1, x4, x8, x16 electrical slots / operates at x1 speed
Power consumption	17 Watt
Form factor	Low profile, half-length, 2.3”x 6.6”
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	1 GB DDR3
Memory interface	64-bit
Memory bandwidth	9.6 GB/s
Pixel depth	32-bit color
Electrical standard	Single-link DVI complying to v1.0 specification
Connectors	DMS-59
Connectivity	One DMS-59-to-DVI adaptor included
Supported resolutions	2560x1600 DisplayPort, 1920x1200 DVI/Analog
DirectX support	Microsoft® DirectX v11.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-2400

Product acronym	MXRT-2400
Bus compatibility	PCIe Gen2 x16
Power consumption	43 Watt
Form factor	169.67 mm (L) x 64.46 mm (H) single PCIe slot wide
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro

Graphics memory	512 MB DDR3
Memory interface	64-bit
Memory bandwidth	14.4 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.1a
Connectors	1- DVI-I, 1- DisplayPort
Connectivity	One DisplayPort to Single-Link DVI-I dongle included
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-2500

Product acronym	MXRT-2500
Bus compatibility	PCIe Gen2 x16
Power consumption	50 Watt
Form factor	168 mm (L) x 68 mm (H) single PCIe slot wide
Operating system	Windows 7 – 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	1 GB DDR3
Memory interface	128-bit
Memory bandwidth	28.8 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.2
Connectors	1- DVI-I, 1- DisplayPort
Connectivity	One DisplayPort to Single-Link DVI-I dongle included
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.2
OpenCL support	OpenCL 1.1
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-4500

Product acronym	MXRT-4500
Bus compatibility	PCIe Gen2.1 x16
Power consumption	75 Watt

Form factor	163 mm (L) x 97 mm (H) single PCIe slot wide
Operating system	Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	1 GB GDDR5
Memory interface	128-bit
Memory bandwidth	64 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.2
Connectors	1- DVI-I, 2- DisplayPort
Connectivity	Two DisplayPort to Single-Link DVI-I dongles included DisplayPort to Dual-Link DVI-I dongle available from Barco; Part Number K9305104
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.1
OpenCL support	OpenCL 1.1
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-5400

Product acronym	MXRT-5400
Bus compatibility	PCIe Gen2 x16
Power consumption	72 Watt
Form factor	230.53 mm (L) x 98.34 mm (H) single PCIe slot wide
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	1 GB GDDR5
Memory interface	128-bit
Memory bandwidth	64 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.1a
Connectors	1- DVI-I, 2- DisplayPort
Connectivity	Two DisplayPort to Single-Link DVI-I dongles included DisplayPort to Dual-Link DVI-I dongle available from Barco; Part Number K9305104
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0

Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-5450

Product acronym	MXRT-5450
Bus compatibility	PCIe Gen2 x16
Power consumption	72 Watt
Form factor	230.53 mm (L) x 98.34 mm (H) single PCIe slot wide
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 - 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	1 GB GDDR5
Memory interface	128-bit
Memory bandwidth	64 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0
Connectors	2- DVI-I
Connectivity	Dual-Link DVI Cables
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-5500

Product acronym	MXRT-5500
Bus compatibility	PCIe Gen3 x16
Power consumption	75 Watt
Form factor	184.15 mm (L) x 111 mm (H) single PCIe slot wide
Operating system	Windows 7 - 32/64-bit, Windows 8.1 - 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	2 GB GDDR5
Memory interface	256-bit
Memory bandwidth	102.3 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)

Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.2
Connectors	1- DVI-I, 2- DisplayPort
Connectivity	Two DisplayPort to Single-Link DVI-I dongles included DisplayPort to Dual-Link DVI-I dongle available from Barco; Part Number K9305104
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.1, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.2
OpenCL support	OpenCL 1.2
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-5550

Product acronym	MXRT-5550
Bus compatibility	PCIe Gen3 x16
Power consumption	75 Watt
Form factor	184.15 mm (L) x 111 mm (H) single PCIe slot wide
Operating system	Windows 7 - 32/64-bit, Windows 8.1 - 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	2 GB GDDR5
Memory interface	256-bit
Memory bandwidth	102.3 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0
Connectors	2- DVI-I
Connectivity	Dual-Link DVI Cables
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.1, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.2
OpenCL support	OpenCL 1.2
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-7400

Product acronym	MXRT-7400
Bus compatibility	PCIe Gen2 x16
Power consumption	138 Watt
Power connector	One 2x3 power connector

Form factor	281.29 mm (L) x 98.53 mm (H) single PCIe slot wide
Operating system	Windows XP - 32/64-bit, Windows 7 - 32/64-bit, Windows 8.1 – 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	2 GB GDDR5
Memory interface	256-bit
Memory bandwidth	128 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	Dual-link DVI complying to v1.0, DisplayPort complying to v1.1a
Connectors	1- DVI-I, 2- DisplayPort
Connectivity	Two DisplayPort to Single-Link DVI-I dongles included DisplayPort to Dual-Link DVI-I dongle available from Barco; Part Number K9305104
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.0, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.0
OpenCL support	OpenCL 1.0
Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)

MXRT-7500

Product acronym	MXRT-7500
Bus compatibility	PCIe Gen3 x16
Power consumption	140 Watt
Power connector	One 2x3 power connector
Form factor	242 mm (L) x 98.53 mm (H) single PCIe slot wide
Operating system	Windows 7 – 32/64-bit, Windows 8.1 - 32/64-bit
Platforms	Intel® and AMD architectures
Graphics accelerator	ATI FirePro
Graphics memory	4 GB GDDR5
Memory interface	256-bit
Memory bandwidth	154 GB/s
Pixel depth	32-bit pixels (supports 8-bit and 10-bit per color channel)
Electrical standard	DisplayPort complying to v1.2
Connectors	4- DisplayPort
Connectivity	Two DisplayPort to Single-Link DVI-I dongles included DisplayPort to Dual-Link DVI-I dongle available from Barco; Part Number K9305104
Supported resolutions	Up to 6MP color and 10MP grayscale
DirectX support	Microsoft® DirectX v11.1, Vertex Shader 5.0, Pixel Shader 5.0
OpenGL support	OpenGL 4.2
OpenCL support	OpenCL 1.2

Approvals and compliance	FCC Part 15 Class B, CE EN 55022 Limit B, EN 55024, UL-60950-1, BMSI CNS, CISPR- 22/24, IEC609050-1, VCCI, CSA C22.2, EU RoHS directive (2002/95/EC), Certificate of Information & Communication Equipment (Republic of Korea)
Operating temperature	0° to 60°C (32° to 140° F)